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**Claims:**

1. A method of controlling a component of a fuel cell system, the method comprising:
  - a) determining a current operating level of the fuel cell system;
  - b) based on the current operating level of the fuel cell system, determining a corresponding setpoint operating level of the component in the fuel cell system;
  - c) adjusting the component toward operating at the corresponding setpoint operating level for the current operating level of the fuel cell system; and,
  - d) controlling the operating level of the component based on closed loop feedback when the operating level of the component is within a selected difference from the corresponding setpoint operating level.
- 15 2. The method as defined in claim 1 wherein step (b) comprises storing a plurality of setpoint operating levels for the component in the fuel cell system, the plurality of setpoint operating levels comprising, for each operating level in a plurality of operating levels of the fuel cell system, a corresponding setpoint operating level of the component in the fuel cell system; and,  
determining the corresponding setpoint operating level of the component in the fuel cell system from the plurality of setpoint operating levels.
- 25 3. The method as defined in claim 2 wherein the step of storing the plurality of setpoint operating levels for the component in the fuel cell system comprises recording, during previous operations of the fuel cell system, a plurality of actual operating levels of the component in the fuel cell system.

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4. The method as defined in claim 3 wherein for each operating level in the plurality of operating levels of the fuel cell system, the corresponding setpoint operating level of the component is recorded from the actual operating level of the component when the fuel cell system is running at that operating level, the actual operating level being substantially stable under closed loop feedback.
5. The method as defined in claim 3 wherein the component controlled is one of a blower for providing process fluid flow to the fuel cell system, a coolant flow control device for providing coolant flow to the fuel cell system, a fuel flow control device for providing fuel flow to the fuel cell system, a process fluid humidification control device for controlling humidification of a process fluid and a purge control device for controlling a fuel purge rate of the fuel cell system.
6. The method as defined in claim 1 wherein
  - 15 a) a plurality of components are controlled;
  - b) step (b) comprises based on the current operating level of the fuel cell system, determining a corresponding setpoint operating level for each component in the plurality of components;
  - c) adjusting each component in the plurality of components toward operating at the corresponding setpoint operating level for the current operating level of the fuel cell system; and,
  - d) controlling the operating level of each component in the plurality of components based on closed loop feedback when the operating level of that component is within a component-specific selected difference 20 from the corresponding setpoint operating level.
7. The method as defined in claim 6 further comprising, for each component, selecting the component-specific selected difference from the corresponding setpoint op rating level for that component based on the operating level of the fuel cell system.

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8. A system for controlling at least one component of a fuel cell system, the system comprising:

a) a plurality of measuring devices for measuring an operating level of the fuel cell system and an operating level of the at least 5 one component;

b) a storage module for storing an associated setpoint operating level of at least one component in the fuel cell system for each operating level in a plurality of operating levels of the fuel cell system; and

c) a controller for adjusting the at least one component of 10 the fuel cell system; wherein the controller is operable,

during an open loop control phase to adjust the at least one component toward operating at the associated setpoint operating level for the current operating level of the fuel cell system,

15 during a closed loop control phase to adjust the operating level of the at least one component based on information from the at least one measuring device, and

20 to switch from the open loop control phase to the closed loop control phase when the at least one component is operating within a selected difference from the associated setpoint operating level for the current operating level of the fuel cell system.

9. The system as defined in claim 8 further comprising a logic module for determining the associated setpoint operating level of the at least one component in the fuel cell system for each operating level in a plurality of operating levels of the fuel cell system.

25 10. The system as defined in claim 9 wherein the at least one component is at least one of a blower for providing process fluid flow to the fuel cell system, a coolant flow control device for providing coolant flow to the fuel cell system, a fuel flow control device for providing fuel flow to the fuel cell system, a process fluid humidification control device for controlling

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humidification of a process fluid and a purge control device for controlling a fuel purge rate of the fuel cell system.

11. A fuel cell system comprising:

- a) a fuel cell for driving a load;
- 5 b) a plurality of measuring devices for measuring an operating level of the fuel cell system and an operating level of the at least one component;
- c) a storage module for storing an associated setpoint operating level of at least one component in the fuel cell system for each
- 10 operating level in a plurality of operating levels of the fuel cell system; and,
- d) a controller for adjusting the at least one component of the fuel cell system; wherein the controller is operable,

15 during an open loop control phase to adjust the at least one component toward operating at the associated setpoint operating level for the current operating level of the fuel cell system,

during a closed loop control phase to adjust the operating level of the at least one component based on information from the at least one measuring device, and

20 to switch from the open loop control phase to the closed loop control phase when the at least one component is operating within a selected difference from the associated setpoint operating level for the current operating level of the fuel cell system.

12. The system as defined in claim 11 further comprising a logic module for determining the associated setpoint operating level of the at least 25 one component in the fuel cell system for each operating level in a plurality of operating levels of the fuel cell system.

13. The system as defined in claim 12 wherein the at least one component is at least one of a blower for providing process fluid flow to the

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fuel cell system, a coolant flow control device for providing coolant flow to the fuel cell system, a fuel flow control device for providing fuel flow to the fuel cell system, a process fluid humidification control device for controlling humidification of a process fluid and a purge control device for controlling a  
5 fuel purge rate of the fuel cell system.